

## (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
16 December 2004 (16.12.2004)

PCT

(10) International Publication Number  
**WO 2004/108649 A2**

(51) International Patent Classification<sup>7</sup>: **C07C 51/295**,  
51/25, 67/05, 67/035, 53/08, 69/01, 69/14

(21) International Application Number:  
PCT/GB2004/002069

(22) International Filing Date: 13 May 2004 (13.05.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
0312965.7 5 June 2003 (05.06.2003) GB

(71) Applicant (for all designated States except US): **BP CHEMICALS LIMITED** [GB/GB]; Chertsey Road, Sunbury-on-Thames, Middlesex TW16 7BP (GB).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **FERGUSON**, Ewen, James [GB/GB]; 5 Burnaby Close, Beverley, East Yorkshire HU17 7ET (GB). **LUCY**, Andrew, Richard [GB/GB]; 24 Station Road, South Cave, Brough, East Yorkshire HU15 2AA (GB). **ROBERTS**, Mark, Stephen [GB/GB]; 23 Danesway, Beverley, East Yorkshire HU17 7JQ (GB). **TAYLOR**, Diana, Rachel [GB/GB]; 16 The Limes, South Cave, Brough, East Yorkshire HU15 2FG (GB). **WILLIAMS**, Bruce, Leo [GB/GB]; The Willows, 4 Glenrock Park, Brough, East Yorkshire HU15 1HF (GB).

(74) Agent: **BROOKE**, Caron; BP International Limited, Patents & Agreements, Chertsey Road, Sunbury-on-Thames, Middlesex TW16 7LN (GB).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

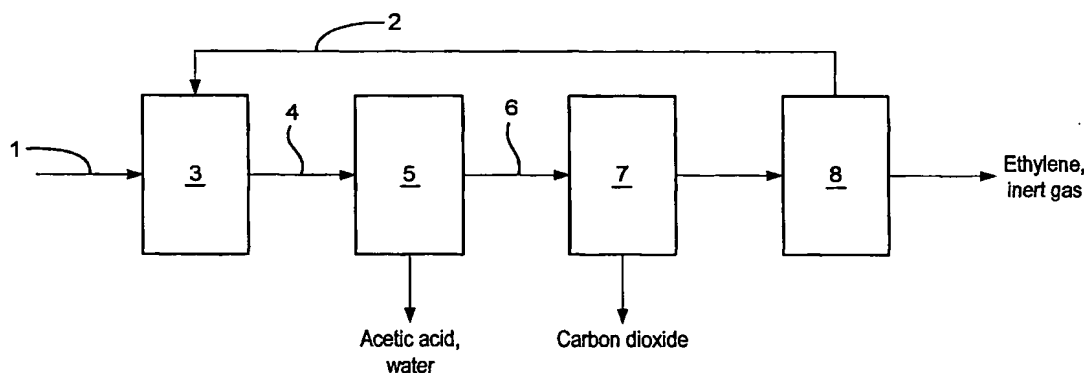
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

#### Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE,

[Continued on next page]

(54) Title: OXIDATION PROCESS FOR THE PRODUCTION OF CARBOXYLIC ACIDS AND ALKENES



(57) Abstract: An oxidation process for the production of alkenes and carboxylic acids from a feed comprising alkene and/or alkane, carbon monoxide, a molecular oxygen containing gas and optionally water in the presence of an oxidation catalyst in which the level of carbon monoxide is maintained between 1% and 20% by volume of the total feed to the reactor.



IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent  
(BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE,  
SN, TD, TG)

— of inventorship (Rule 4.17(iv)) for US only

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

**Published:**

— without international search report and to be republished  
upon receipt of that report